



JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
LANSING

KIRK T. STEUDLE
DIRECTOR

February 10, 2009

The Honorable Bill Hardiman, Chair
Senate Appropriations Subcommittee
on Transportation
Michigan State Senate
P.O. Box 30036
Lansing, Michigan 48909

The Honorable Lee Gonzales, Chair
House Appropriations Subcommittee
on Transportation
Michigan House of Representatives
P.O. Box 30014
Lansing, Michigan 48909

The Honorable Jud Gilbert, Chair
Senate Transportation Committee
Michigan State Senate
P.O. Box 30036
Lansing, Michigan 48909

The Honorable Pam Byrnes, Chair
House Transportation Committee
Michigan House of Representatives
P.O. Box 30014
Lansing, Michigan 48909

Dear Senators Hardiman and Gilbert, and Representatives Gonzales and Byrnes:

In accordance with Section 1i(4) of 2001 PA 259, enclosed is the Michigan Department of Transportation's annual report on the Pavement Demonstration Program.

If you have any questions regarding this report, please contact either me or John C. Friend, Engineer of Delivery, at 517-335-1697.

Sincerely,

Kirk T. Steudle
Director

Enclosure

BOHD:C&T:MJE:clc

cc: Members of the Senate and House Transportation Committees
Members of the Senate and House Appropriations Subcommittees on Transportation

Michigan Department of Transportation Pavement Demonstration Program Status Report January 2009

Background

Public Act 259 of 2001 allows the department to build up to four demonstration projects per year that are not subject to a Life-Cycle Cost Analysis (LCCA). The LCCA process is a tool to select the lowest cost pavement design over the expected service life of the pavement. The LCCA process must include, by law, historical information for initial construction and maintenance costs and performance (service life). This information may not be available for new pavement designs, thereby precluding them from being chosen as an alternative. Also, new pavement designs and new technologies are generally more expensive than the standard methodologies, which may reduce their chance of being selected as the lowest cost alternative. The pavement demonstration legislation provides an avenue to try new and innovative ideas.

Potential benefits of pavement demonstration projects include improved service life and customer service, and lower maintenance costs. Future LCCAs may utilize cost, performance, and maintenance information from the demonstration projects.

Project Selection

Candidate projects are a collaborative effort between central office pavement personnel, region personnel, and industry groups. A work plan is developed that explains the demonstration aspect, its potential benefits, and how its performance will be monitored. Once the partners mentioned above reach a consensus that the project would make a good candidate, it goes to the Engineering Operations Committee (EOC) for formal approval. Once EOC approves the project, it becomes part of the Pavement Demonstration Program.

Extra costs for the demonstration project are funded by the region's rehabilitation and reconstruction budget.

Project List

The following table contains a list of demonstration projects to date.

Table 1. Pavement Demonstration Project List							
FY Let	Route	Region	County	Location	Description	Pavement Costs	
						Hot Mix Asphalt (HMA)	Concrete
2003	I-75 NB	North	Ogemaw	Ski Park Rd. to Roscommon County Line	low volume unbonded overlay		\$1,980,000
2003	M-84 SB	Bay	Bay/Saginaw	Pierce Rd. to Delta Rd.	perpetual pavement	\$700,000	
2004	M-3	Metro	Wayne	St. Aubin to McClellan	thin unbonded overlay		\$2,200,000
2005	M-13	Bay	Bay	Mary Dr. to North St.	low volume concrete		\$1,200,000
2005	I-96 WB	Metro	Wayne	M-39 to Schaeffer Rd.	perpetual pavement	\$4,800,000	
2006	M-99	Univ.	Jackson	Village of Springport	low volume concrete		\$100,000
2008	I-75 NB	North	Cheboygan	Topinabee Mail Rd. to Riggsville Rd.	perpetual pavement over rubblized concrete	\$800,000	

Below is a brief description of the status or condition of each project based on recent field visits.

I-75 Northbound (Ogemaw County): This project, constructed in 2003, is a 6-inch unbonded concrete overlay on the northbound direction only. It includes several test sections involving sealed and unsealed joints, 10- and 12-foot joint spacing, and transverse joints with and without load transfer bars. The southbound direction was rubblized and overlaid with 6.5 inches of hot mix asphalt (HMA) at the same time. At the most recent visual evaluation (December 2008), very little new cracking was found. Several longitudinal cracks that were only a few feet last year, have increased to over 20 feet long. Initial investigations into the cause of the cracking were begun last summer. A more in-depth investigation will occur this summer when several sections of cracked concrete will be removed as part of a concrete repair project.

M-84 Southbound: This project is a 6.5-inch HMA perpetual pavement completed in the fall of 2005. This was a two-lane road that was upgraded to a four-lane boulevard section and was built over a two-year period. The northbound direction contained a standard 6.5-inch HMA cross section and was built in 2004. The southbound contains the perpetual pavement, which is designed for a 40-year life. Polymerization of the HMA and a thicker base are expected to increase the service life over the standard cross section. The perpetual pavement is in as-constructed condition (no distresses), while the standard section has 15 transverse cracks. All cracks were overband crack filled in 2008. This included the ends of areas that were milled and resurfaced during original construction and some centerline cracking. Both of these are considered construction related problems.

M-3: This project is a 4-inch unbonded concrete overlay constructed in the fall of 2005. Normal unbonded overlays are 6 inches or thicker. This project contains four test sections involving a combination of sealed and unsealed joints with two different HMA bond breaking interlayer mixes. The HMA interlayer mixes are a normal dense-graded HMA and a more open-graded (drainable) HMA. This project was visited in December 2008 and 191 of the roughly 5- by 5-foot concrete panels have a crack. This is a 75 percent increase over the previous year, and the second consecutive year with a 75 percent increase. However, this represents only 1 percent of the total concrete panels on the project. Additionally, a majority of the cracks are around drainage structures (manholes), which are typically problem areas for cracking. A Metro Region investigation into a large shattered area at an intersection revealed concrete only 1.5 inches in one location, which is much thinner than the 4-inch design. No differences in the test sections have been noted at this point.

M-13: This project is a low-volume concrete design constructed in the summer of 2005. The concrete is 6 inches thick compared to the normal 8 inches. Joints are spaced 5.5 feet in both directions and are unsealed. A dense-graded base was used instead of the normal open-graded base material. During a December 2008 visit to the project, six cracks were noted, which is only one more than the previous year. Three of these cracks are adjacent to drainage structures.

I-96 Westbound: This project is a 14-inch HMA perpetual pavement constructed in the fall of 2005. The eastbound direction was reconstructed with concrete. The concrete is a 20-year design while the perpetual pavement is a 40-year design; this is not a side-by-side comparison. In December 2008, a visual examination was conducted and it is in as-constructed condition (no distresses found).

M-99: This is the second low-volume concrete design project and is the same as the M-13 project, except the joints are spaced at 6 feet in both directions. It was constructed in

summer/fall of 2006. Within a few weeks after concrete placement, several cracks were noted. It is believed these were due to late sawing of the joints. A visual examination in January 2009 revealed several new cracks, bringing the total number of observed distresses to 27. At this point, these distresses are not deteriorating to the point that they are affecting ride quality.

New Projects

In the fall of 2008, a perpetual pavement was built on I-75 northbound in Cheboygan County from Topinabee Mail Road north for two miles. This one was different from the previous three in that the existing concrete surface was rubblized and 8.5 inches of HMA was placed over it. Originally, it was to be built in 2010, but was moved to the fall of 2008 when extra money became available. As in the case of previous perpetual pavements, the design was for a 40-year life.

Future Projects

One project will be built in 2009. M-1 (Woodward Avenue) in Detroit between Tuxedo and I-94 will be a thin unbonded overlay similar to the M-3 project. The project will be let in May 2009. The cost of the pavement for this demonstration project is estimated at \$930,000.

Prepared by: Michael Eacker, P.E.
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